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ABSTRACT

The Continuing Education Division of Canadore College has implemented an individualized learning systems approach to instruction in their Adult Basic Education program. Since most adult students are dropouts or failures from traditional learning situations, a system was developed which utilizes educational technology to obtain better learning outcomes. Performance objectives define exactly what the student must perform, describe the conditions for performance, and provide the standard of acceptable performance. Objectives are either purchased or designed by the faculty, and are often used in combination. The important key to individualization is the use of cognitive style mapping which gives a picture of how each student perceives, seeks meaning, and obtains information from his environment and personal experience. Through cognitive style mapping, students are routed to educational programs that are built on their cognitive style strengths. To evaluate student progress, continuous spot checking through a computer based, criterion-referenced longitudinal testing program is used. This Comprehensive Achievement Monitoring model, primarily a management tool for the instructor, will provide pretest, posttest, trend and learning retention data as well as an automatic system for validating objectives. (MJK)

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Continuing Education

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LEARNER AT THE CENTRE:

A Project in the Management of Learning

Innovative Approaches to Adult Basic Education in the Continuing Education Division of Canadore College, North Bay

Conceptions Novatrices De L'Éducation De Base Des Adultes De La Division De L'Éducation Permanente Canadore College, North Bay

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INNOVATIVE APPROACHES TO ADULT BASIC EDUCATION IN THE CONTINUING EDUCATION DIVISION OF CANADORE COLLEGE, NORTH BAY

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1. The Process Begins

In April 1971, the Dean of the Canadore Continuing Education Division, North Bay, began to experiment with innovative educational methods in an attempt to obtain better learning outcomes from division programs. In addition, instructors desired to be evaluated and it became obvious to administrators that traditional measures used in evaluation were unsatisfactory. We wanted to find a process that would allow the precise measurement of learning and permit administrators to evaluate instructors on the basis of whether or not learning was actually taking place under their direction.

Don Stewart, of SLATE (Systems for Learning by Application of Technology to Education) Services, has said that, "Learning often occurs by chance rather than by design", and we came to the same conclusion about our own program. (At this time we had been operating solely on the traditional model. We made little or no use of instructional technology and employed lock-step timetabling and grade level distinctions with no real recognition of individual learning differences other than the fact that so many students "passed" and so many "failed".)

Instructors were proud of the "quality" and the "high level" of their courses, but without empirical evidence of specificity this was impossible to quantify or even qualify.

The search for a better way began and the path led to experiments with programmed learning materials. We quickly found that programmed learning was but *one* tool for the instructor and certainly not totally satisfactory. In fact, using programmed material without specifying objectives proved to be almost fruitless. Objectives should be clearly specified before the programmed materials are written. Obviously we had to have a more adequate starting point.

2. The Learning Systems Approach to Instruction

We scheduled two workshops on behavioral objectives and the learning-systems approach to instruction. Before the workshop, an instructional technologist was hired to be our educational services officer. This officer proved to be essential, especially in the beginning phases of a new program. Workshop leaders can take faculty to new levels of readiness to implement innovations

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but they also need someone qualified to develop and work with them after the workshop. Projected innovations are usually not successfully implemented because of lack of continued support. The educational services officer provided this support.

The systems approach to instruction and its essential component—"the behavioral objective"—were accepted by faculty and administrators to be viable alternatives to traditional approaches to instruction. We were involved with basic education for adults who obviously do not have time to waste in lock-step programs. These adults themselves were aware that people learn at different rates. We have found that adults want us *to be innovative and teach them only what they can't do!* The majority of adults taking basic education are drop-outs or failures from our elementary and secondary systems. It is ridiculous to sit by and receive payment for duplicating the traditional methods which put these persons in the drop-out or failure category.

In August, 1971 a commitment was made to the systems approach to instruction and the division fully implemented a process of individualization in its basic education programs.

We have mentioned the terms systems approach, learning systems and behavioral objectives. What do these terms mean?

A behavioral, or performance objective contains three items: an outline of what the student must be able to do, a description of the conditions under which he must be able to perform, and the standard of acceptable performance.

The following is an example of a behavioral objective taken from Mager:

"The student must be able to write a musical composition with a single tonal base. The composition must be at least 16 bars in length and contain at least 24 notes. The student must demonstrate his understanding of the rules of good composition by applying at least three of them in the development of his score. The student is to complete his composition within four hours."[1]

Behavioral objectives were fully implemented so we could be sure that both instructors and students knew what they had to do.

Once we knew what a behavioral objective was and had written some, we realized that to write objectives for all our programs would take too long, be costly and to our minds be a "reinvention of the wheel", since many commercially prepared objectives were already available.

An eclectic approach was used in which our own objectives, written by the faculty, were combined with the many available commercially produced objectives to get our process of individualization started.

For our definition of a system we can turn to Dr. L.C. Silvern:

"A system is simply the structure of organization of an orderly whole, clearly showing the interrelations of the parts to each other and to the whole itself."[2]

More explicitly:

"Systems Approach is a process consisting of four major parts; anal-

ysis, synthesis, modeling and simulation."[3]

In 1965 Silvern introduced the term 'Anasynthesis' for the above process. Anasynthesis applies to any system, not simply to that of curriculum development in education.

There follows a discussion of two further innovations that are contributing substantially to our development of a systems approach to instruction.

3. The Educational Sciences

The Dean of Continuing Education, and the educational services officer have participated in the Educational Sciences course given by Oakland Community College, Michigan. We see the Educational Sciences as defined by Dr. Joseph Hill, President of Oakland, as a key to furthering and directing our attempts to innovate while individualizing our programs.

Presently we place a student in our individualized programs without really knowing his cognitive style. The Educational Sciences, as a conceptual framework, will permit us to begin to reach every student in our individualized program and help us direct him to learning situations appropriate to this style.

The Educational Sciences as defined by Dr. Joseph Hill are: symbols and their meaning, cultural determinants of the meanings of symbols, modalities of inference, biochemical and electro-physiological aspects of memory, cognitive styles of individuals, teaching, administrative and counselling styles, systemic analysis and decision-making. (See Appendix F for a paper on the Educational Sciences and a bibliography.[4])

Cognitive Style Mapping

Through the use of cognitive style mapping we can begin to route our students to personalized education programs that are built on their cognitive style strengths. We can also augment the cognitive style weaknesses found through analysis of the map. Drs. Hill and Nunney define cognitive style mappings as follows:

"The cognitive style map gives a picture of the way a student derives meaning from his environment and personal experience. Each map, like each student, is different. A student's cognitive style is determined by the way he takes notice of his total surroundings — how he seeks meaning — how he becomes informed. Is he a listener or a reader? Is he concerned only with his point of view or is he influenced in decision-making by his family or group associates? Does he reason more like a mathematician or social scientist or fisherman? (See Appendix E.)"

We can investigate and use administrative, counselling and teaching-style information to fully realize the potential of our ***human resources*** which at present we know very little about.

In order to advance our degree of learning-systems implementation, we have begun to use the Education-

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al Sciences as the framework and have already mapped a large group of basic education students.

We reached a point in the implementation of an individualized process at which we seemed to be "marking time" and began to have problems without solutions. There was seemingly no way to augment the statistical gain scores we received after the individualized process was implemented.

Through the Educational Sciences in general, and cognitive style mapping in particular, we should be able to increase our gain scores and have a more effective system using the present individualized process as our base.

4. A Sophisticated Evaluation System For An Individualized Program

The Canadore Comprehensive Achievement Monitoring Model

Earlier this year, we investigated an evaluation system developed by Dr. Wm P. Gorth and Dwight W. Allen at the University of Massachusetts. Comprehensive Achievement Monitoring (CAM) is a computer based criterion-referenced, longitudinal testing program using sampling techniques.[5] We know very little about retention of objectives by students in our program. We presently can say only that the student achieved the objective on a given day and at a given time but how long he retains it is not yet determined. We recognize the importance of instituting a system that will provide answers to questions of retention of objectives by our students.

Dr. Robert O'Reilly (Chief of the Bureau of School Cultural Research, New York State Department of Education) implemented CAM in many schools in New York State. CAM includes interchangeable test instruments derived through stratified random sampling. These are administered continuously as a student progresses through his individual set of objectives.

We have also noticed that as a student progresses through a unit he often learns portions of objectives which are yet to be met in later units. CAM would document this and students would not be forced to re-do objectives they had already met. Thus, we will not rely on a single pre-test at the beginning of a unit to appraise which objectives a student must achieve. CAM accounts for the dynamics of learning through objectives. CAM is primarily a management tool for the instructor—it helps him *manage the learning in an individualized program.*

Canadore College with the help of Dr. O'Reilly and the co-operation of Dr. Ewald B. Nyquist—Commissioner of Education, the State Education Department of New York—is now in the process of implementing CAM in the Continuing Education Division Programs.

We have developed a Canadore CAM Model for Individualized Programs. We know that CAM will introduce economy into our testing through the use of item and person sampling techniques. The CAM Computer Programs being developed will provide pretest, posttest, trend and retention data as well as an automatic system for validating objectives and other components of

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the system. This model is designed to sharpen our ability to intervene in the prescription phase so as to make these suggested learning activities more accurate for each individual learner.

5. Instructional Materials, Equipment and Subject-Matter

An Eclectic Approach to Materials

We used the excellent materials produced by Saskatchewan NewStart to get our process of Individualization started. Saskatchewan NewStart considered their materials a "starter kit" and they have lauded us for being true to that concept. At North Bay their materials were used as a starter kit which we augmented and revised to suit our needs. Information gained through use of these materials, along with changes, was fed back to curriculum developers at NewStart.

The Saskatchewan NewStart materials were found to be too print-oriented in their prescriptions for *our* adapted use. Almost immediately we began to supplement a wide variety of commercially-produced and faculty-developed media software. Saskatchewan NewStart provided our process of individualization with an immediate core of materials upon which to build a program that would be adapted to our needs through judicious selection of other packages.

A Variety of Audio-Visual Equipment and Materials

Students were given individualized programs and they progressed at their own learning rates.

The heavy previous emphasis on print media was altered through the purchase and development of a wide variety of media as vehicles to facilitate learning individual objectives. Audio-visual equipment was purchased that was complementary to the new media.

The quality of media is very important. For example, we found some students dislike purple ditto prescription sheets and yet reacted very favourably to colored prescription sheets expertly printed in black on an offset press. We must know what "turns a student off" if we expect to bring about learning. Malfunctioning equipment, or poor audio or visual material may do more to *impede* learning than to help it.

Commercial Packages and Faculty Produced Material

The basic education program uses commercially prepared packages in communications and mathematics. The individualized science curriculum is based upon a faculty-developed program. Much of the purchased material has been revised, rewritten, augmented and adapted to our needs. We have also acted in a field-testing capacity for individualized media to meet needs of individual students.

Several questions regarding faculty production must be considered: Who holds the copyright? Should we have several packages produced if we know that the cognitive style of the person producing the package may determine the style of the package? Should instructors be given released time to write programs especially when none are available commercially?

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As a rule we purchase objectives rather than write them. It is less expensive and the market place currently offers objectives for almost any program one wishes to give.

Humber College's ***Randa Package*** *of Objectives for* ***Individualized*** *Programs*

The revised Humber Randa (Retraining and Apprenticeship) package was a welcome find in our eclectic search for additional "higher level" objectives. We have profitably integrated major portions of the English and Mathematics packages to augment our own programs.

Life Skills or ***"Coping"*** *Skills*

In our program we feel that life or "coping" skills are a necessary component of our educational goals and we are currently investigating the most suitable ones for our purposes from the following sources: Metro Basic Training for Skill Development (BTSD) Committee Life Skills objectives and matrix, Saskatchewan NewStart Life Skills Program, the Rural Family Development Program of the University of Wisconsin and Oakland Community College General Orientation program.

What has only recently come to our attention is the work of Professor George Isaac Brown of the University of California on "confluent education". Our investigation of the work done in developing coping skills has led us to conclude that the total emphasis on the cognitive element is perhaps simply too "exclusive" an approach. What has happened is that one of the oldest traditions in western education is being forgotten: education of the total human being. A vital part of this is the education of the affective capacities of our students. Quite often students drop out of schools because they feel they are irrelevant or dehumanized. The way to combat problems with students dropping out and becoming alienated is for educators to come to grips with the affective side to education. Professor Brown's framework offers a way to bring about confluent education where there is an "integration or flowing together of the *affective* and *cognitive* elements of individual and group learning—sometimes called humanistic or psychological education".[6]

Validation *of Materials*

Validation studies were undertaken by the educational services officer on a large segment of our commercially purchased objectives and test instruments. The results of our validation studies were made available to students, faculty, administrators and producers of the material as well as administrators and faculty of other colleges who were using the same materials. (These results are available through our educational services officer.)

Evaluation Committee on Instructional Packages

The subject of evaluation has become critical and the Northern Regional BTSD Committee, chaired by the Dean of Continuing Education at North Bay, is presently meeting to write and distribute a manual on the validation of packages for use by administrators and faculty in the colleges.

The projected manual will stress the design of validation projects in

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order that colleges can begin the task of validating much of the material that is currently being used.

At North Bay we have undertaken studies to validate the NewStart communications material and our own faculty-developed materials in communications, mathematics and science as well as commercially-prepared materials.

Student Orientation to Materials and Equipment

Student orientations changed from rules-oriented discussions to a program that introduced a student to the systems approach to instruction with each faculty member. The orientation should be an individualized program using behavioral objectives as the vehicle. Orientations also include instruction in the operation of instructional hardware, such as video-cassette playback units, tape recorders, filmstrip-audio units, language machines and teaching machines.

Once you have a process of individualization, the student will use a greater variety of media and equipment. Without instruction in the operation of this equipment there will be less effort made to seek out different resources.

We have found that as much of the audio-visual equipment and materials as possible should be portable. This facilitates rearranging carrels and permits students to take equipment and software home for further practice and reinforcement. (See Appendix B for a "script" for an audiovisual student orientation to the Systems Approach.)

Student Attitudes as a Means of Development

We have conducted student attitude surveys and the results of these surveys have given rise to many changes in procedures and materials as our implementation progresses. We have produced a series of video tapes on student reactions. Some of the tapes document student reaction to both individualized settings and traditional ones.

6. Placement, Testing and Evaluation

The Grades 5 - 12 Adult Basic Education Program

The adults who joined our program lacked the necessary prerequisite standing of either a grade 10 or grade 12 to enter their chosen skill training or apprenticeship programs. Participants in the program were permitted to avoid a lock-step system of traditional grade level and to begin an individualized college grades 5 - 12 program. Students could enter the program at any time, be evaluated through placement inventories, *and work at only what they demonstrated they could not do upon entry.* If a student successfully completed all placement inventories he would be granted the college grade 10 or 12 certificate (which is not equivalent to the secondary school diploma in Ontario, but is all that is required for further skill training).

The Role of Testing and Placement in an Individualized Program

Essential to an efficient individualized program is a diagnostic

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testing centre whose personnel administer the tests for cognitive style mapping—a computerized program to determine learning strengths—placement inventories and the many individualized pre-tests and post-tests.

The diagnosticians in the centre must have a close relationship with each instructor as the interpretation of the test results should be done jointly by the instructor and the testing centre personnel.

Tests are but one indicator the instructor uses in his professional role as diagnostician and decision-maker in the learning process. Therefore, he uses test information tempered by his professional judgment in prescribing a route for the student to complete objectives.

We don't hide tests and answers from students. The approach in a systems-oriented program is to take the mystery and fear out of tests by giving the students the objectives and telling them what they are going to do. To be meaningful, tests must measure the students' achievement of the specified objectives.

We found that cheating may occur. Some students may go through several units by simply copying answers in written tests. This is easily avoided through oral tests built in as program objectives. Our new tracking system also assists in bringing cheating to a minimum. If cheating is a problem, some selected test instruments can be given in a rigorously supervised atmosphere to check on student progress.

It has been found that the Canada Manpower Centre (CMC) should do no testing before the student comes to the college. The college placement inventories and other tests are sophisticated enough to tell us what the student can and cannot do. Thus standardized tests, not related to our objectives, tend to be a waste of time. Also, if standardized scores are given to the student they may tend to prejudice his performance on our placement inventories.

Criterion-References and Norm-Referenced Evaluation

Behavioral objectives and a systems approach to instruction necessitated a criterion-referenced measurement system (i.e. the student must be able to perform at a specified level of accuracy which in most instances is at 80%), and we implement criterion-referenced measurement without disregarding the valid, but different application of norm-referenced measurement. In our program criterion-referenced measurement is used to keep track of the individual student's achievement and progress rather than an assessment based upon any comparison with a group. (For a discussion of norm-referenced and criterion-referenced measurement see Popham's Criterion-Referenced Measurement[2], or view the Vincet filmstrip-cassette presentations on evaluation.[6])

Tracking the Student on an Individualized Program

Systems have been developed to track the daily progress of every student on each objective of each subject. A tracking system is critical to the success of the process because it provides data for the student, the instructor, the educational services officer, the administrators, the counsellors, and the sponsoring

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agencies. Without immediate, reliable tracking data, adequate *decision making* by instructors is hampered; student progress is slowed; validation of material is impossible; sponsoring agencies lack data about clients' possible early or late completions; and cost savings can't be ascertained.

We now have a computer system for tracking each student by recording pretest and posttest data. The computer produces the unexcused absence report and detailed enrollment information as required by Canada Manpower. We eventually hope that this computer tracking system of learner achievement data can be accepted by Canada Manpower in lieu of the presently utilized unexcused absence attendance record.

Evaluating the Individual Student

The traditional A, B, C, D, F grading system was eliminated in favor of an A, B, I system where B = 100%, completion of objectives with a proficiency score of 80 - 85%. A = items in addition to B that are specified by the instructor to the student as required for an A, and I = Incomplete. Every student beginning the program is considered to be "I" until he completes all of the objectives of his program and he reaches the "B" standing. (An A - I system is presently being contemplated because if an item is important and you can state it behaviorally, then it should be part of the 100% required for the present "B".) Several persons have developed a matrix of objectives relating to occupations. It is better to relate an A - I system to an objectives-occupation matrix than to use an A, B, I system to achieve the same thing.

7. Staffing and Professional Development

A Team Approach to Implementation

It is important that senior administrators be committed to these innovative approaches to education. Too often, faculty get involved in innovations only to find administrative support lacking and programs therefore fall short of what could be achieved.

In the Continuing Education Division we took a "team approach" to individualization. The team consisted of the Dean of Continuing Education (Paul Dudgeon), the Educational Services Officer (Andy Jimenez), and the Chairman of the Continuing Education Division (John Brock). Specific roles are demanded, and the system becomes effective only when the team member plays his unique role.

The Dean's role is to manage the operation, specify the policy, ***know where the operation is***, know where it is going and assemble and direct the resources to get it there. The Educational Services Officer is charged with the job of providing the systems approach "know how" to support and develop administrators, faculty, counsellors, students, programs, objectives and evaluation. The chairman is the man on the "firing line" and his job is to interact with faculty and students and implement the planned innovation at the operational level.

In our division, the team approach worked well, and each team member interacted with the others to fully implement the system. The team was able to operate as a problem-solving group permitting a

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fairly smooth implementation and avoiding many potential impasses. The team combined to measure learning outcomes and provide an effective program of basic education for adults in the North Bay area.

Where Will the New Faculty and Administrators for the Systems-Oriented Roles Come From?

A significant problem in implementing a systems approach to education is, "Where will we get the trained personnel?" When we have worked with people to get programs under way we have found that they usually have a need for specially trained people who are often not available.

A need exists for administrators, faculty, counsellors, paraprofessionals, educational services officers, instructional technologists and audio-visual technologists - all with expertise in the learning-systems approach to education in general and to curriculum development in particular.

After having recognized the real needs in our area, I am plagued with questions. Are our university colleges of education preparing instructors and administrators for the systems-oriented need of the community colleges? Or are they preparing people primarily oriented to the *present* needs of secondary and elementary schools?

Community colleges account for a large portion of education in Ontario and someone must take the responsibility to prepare administrators and faculty trained in systems and the educational sciences.

I submit that we should do more institutional research to give us a strong base. We must also determine who is best suited to produce the specialized kinds of administrators and faculty that we need to meet the challenges of innovation we find in the colleges today.

Professional In-Service Development

In the Continuing Education Division we place a strong priority on professional development and elicit all help available from the Ministry of Colleges and Universities, especially from the curriculum and professional development sections.

Training Instructors to Implement a Systems Approach to Instruction

Instructors were trained through workshops followed by concentrated assistance from the educational services officer. In an effort to "practise what we preach" the educational services officer individualized his programs to augment instructor ability to use the learning systems approach. (Appendix A contains a description of the process used to develop the Continuing Education Division faculty.)

The Use of Paraprofessionals and Peer Tutors

A process of individualization opens the door for the innovative use of paraprofessionals trained to work in a systems-oriented instructional environment. Also, peer tutoring becomes a process that if supported and paid for, can be of tremendous assistance to students

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with learning problems. Some students relate much better to peer tutors than to instructors or even paraprofessionals. It is dishonest to use a peer tutor without pay. Peer tutoring with or without pay may slow the tutor's progress. Some people believe that peer tutoring helps the tutor learn his own work more thoroughly, but I feel there are definite limits to this.

Paraprofessionals are used in our program to do routine work helping students meet objectives. This frees instructors to play their professional role as learning diagnosticians, decision-makers and resource persons within the learning environment. Our paraprofessionals and instructors are resource persons to the students and they often solve learning problems by working in teams. (See Appendix F for a description of the hierarchy of the roles of paraprofessionals in individualized programs.)

8. Interface With The Department of Manpower and Immigration And Its Canada Manpower Centres (CMCs)

Our BTSD grades 5 - 12 program is primarily designed to meet the basic education needs of Canada Manpower clients in the Nipissing area. The terminal objectives of the program are geared to be the entry requirements of the client's chosen skill program.

In December 1971 we met with local and regional CMC officers to discuss problems for the college inherent in the CMC lock-step purchase system. This purchase system was impeding the full realization of the benefits in our individualized process.

A fully individualized program demands a variable time purchase by the CMC with no grade level specifications. Grade levels become meaningless in a 5 - 12 individualized program. Purchasing a fixed number of weeks is also meaningless because students learning at different rates require different amounts of time to complete the program. The CMC's grade-level, fixed-time system of purchasing was clearly inappropriate in our individualized setting.

CMC representatives, both regionally and locally, were quick to respond to the problem. They solved it by giving us the needed open or block purchase as an experiment. They also indicated a strong willingness to meet new problems in a spirit of co-operation.

CMC's positive role permitted students who were incomplete to spend the few extra days or weeks necessary to complete their programs. Those who were completing early were graduated immediately and new CMC candidates refilled the positions vacated by the "early completes".

The block purchase concept and the elimination of grade level specification in CMC purchases was done within the limitations of the 52-week CMC time restrictions for BTSD.

It only makes sense to spend taxpayer's money for exactly the amount of training needed for a particular client. Some clients need 10 weeks to complete 5 - 12 while others may need 75 weeks. Even the 52 week restriction limit should be variable. The CMC as the purchaser of training, should decide how far beyond the 52 weeks they desire to go for individual clients. We could have a candidate who learns

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at a slow rate but who has done very well and may have an "A" at week 52. Another client may need 10 more weeks to receive the college's grade 10 certificate. I feel that the cost to a taxpayer at this point is greater if we impose the 52-week rule than if we give the candidate 10 more weeks to make it to the status of a productive employee with a grade 10 education.

I have explored the 52-week limit as an example of the continuous questions faced by the CMC and the college in attempting to implement the systems process. We have found a positive and continuing dialogue with the CMC which is absolutely necessary at the regional level and this has paved the way to experiment with and solve problems of implementation.

The CMC office in North Bay participated in ongoing discussions with college personnel and this cooperation led to a team approach to solve mutual day-to-day problems of implementation at the local level.

The local CMC appointed one contact, or liaison person, whose job description included becoming familiar with the problems of implementing the systems approach.

CMC personnel attended college seminars and programs to become fully acquainted with our methods of instruction. In one case, a CMC counsellor was given a certificate in basic education instructor training in individualized programs after participating in our seminar.

CMC personnel thus came to understand our problems and we appreciated their concerns. Close liaison during changes affecting them, especially the institution of a tracking system, permitted the CMC to make valuable inputs which helped to solve information and processing problems for their office.

Without a close problem-solving liaison between the local CMC and the college, implementation could be disastrous. Also, the CMC must be committed to a learning-systems approach and familiar with the process in order to effectively assist the college in solving implementation problems of mutual interest.

9. Some Successes And Problems.

Our program records show success as well as a cost savings. Students are completing their programs earlier than under lock-step arrangements. Students are able to progress at their own learning rates. It is this process of individualization which is itself a success because it provides the base for other benefits. More students are receiving A's and B's. There are no "failures". (Many who would fail in a traditional setting now receive A's after taking a longer period of time to complete their work and program.) Even those students who drop out have an I which permits them to return at any time *they choose*, and resume their studies at their functioning level.

A definite success of the program to date has been a significant increase in the number of students graduated on the basis of the same number of seats. Furthermore, we have achieved an almost null drop out rate specifically due to learning problems.

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Physical Facilities

Initially we operated in a rented secondary school during evening hours. Therefore we were unable to fully implement the physical arrangement we feel is critical to full utilization of individualization. Our first year of implementation was carried out under some severe constraints.

The Continuing Education Division now shares facilities in one of the most modern educational centres in Canada. In fact, there are four separate post-secondary institutions housed in the one centre.

The physical relocation has had the most beneficial results on our student's attitude toward themselves and their program. The word "retraining" is gradually being dropped from all designations and the students have come to regard themselves as *community college* students. The concept of the community college includes, without discrimination, the student working through the Adult Basic Education Program in the Continuing Education Division.

Our new physical facilities have provided us with more freedom of movement and a better arrangement of hardware and software. One obvious benefit of the new location is our Evaluation Resource Centre. Here the students work through all "significant" testing which is related to our student progress records.

Cost Management

The cost of individualized programs is usually uppermost in the hierarchy of questions asked by administrators contemplating implementation.

In the Continuing Education Division we see a need to examine cost effectiveness, cost benefit, and cost utility with reference to our individualized programs. We would like to try to implement the Cost-Ed Analysis developed and applied by Charles Blaschke, President of Education Turnkey Systems Incorporated, Washington, D.C. (See Appendix C for more detail on Cost-Ed Analysis.)

We need a management simulation that will adequately define for administrators and sponsoring agencies every possible trade-off and compute future opportunities for savings.

Interestingly enough, increased short-run costs can also mean a substantial cost-reduction to taxpayers if we are saving a failing student from years on the welfare and unemployment rolls without a chance to contribute to the economy.

We have been able to implement a systems approach to education in the Continuing Education Division *without* an increase in budget and only our status as a small program may prevent us from making larger and larger cost savings, especially where economics of scale are involved.

In order to implement the programs in the Continuing Education Division we set priorities and spend only on those things that advance our ability to have an efficient systems approach to education.

Problems With Receiving Programs

We have faced some problems when students graduate from our

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program at the grade 10 level and proceed to a skill program or grade 11 and 12 in other colleges or programs where objectives are not specified for their own grade 10 level. A greater problem exists where receiving programs state that their 11 and 12 programs are not related in specificity or continuity to our 10 level. In one case a candidate's 10 was questioned when he wished to do an 11 program where standards were considered to be of "high quality, and pretty rigorous". Only specificity in receiving programs can make transfer smooth for graduates of programs where objectives have been specified. You cannot compare a program with specified objectives to a program where objectives have not been specified.

It is impossible to validly compare out grade 5 - 10 program with those secondary and elementary school programs that base their standards and grade progressions on required texts and seat time and where instructors really can't specify what a student must be able to do after receiving instruction for a lengthy time period. (Comparisons are also impossible if norm-referenced evaluation is used to the exclusion of criterion-referenced measurement.)

One obvious solution is simply a channel of improved communications between retraining programs and a sharing of information and problems.

10. Information Dissemination

Sharing

Systems implementation involves sharing because no one has, or ever will have, the "perfect package" or method that will do everything. We must be eclectic in our choice of methods and materials. It is only through sharing successes and failures in programs, objectives and resources, that we can develop our field and permit others to build upon our efforts. We have spent a great deal of time, provincially and regionally, assisting others in the work of implementing innovative programs of individualization. Hopefully, through sharing we avoid needless duplication of effort. The "name of our game" is building upon successes.

Requests For Information

The Continuing Education Division has had many requests for information on implementation of a learning systems approach to instruction and we responded individually to these requests by assisting visiting teams from other Ontario colleges.

In May, 1972 we held a five day seminar on implementing innovative methods in retraining programs. The course was attended by fifty participants representing twelve Ontario Community Colleges. (See Appendix D for the objectives of the five day seminar for administrators ard instructors.)

In September, 1972 the Continuing Education Division held a one-day workship on evaluation (specifically Comprehensive Achievement Monitoring) under the direction of Dr. Robert O'Reilly.

In October, 1972 we hosted a two day seminar on the Educational Sciences as developed by Dr. Joseph Hill, President, Oakland Community College, Michigan.

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Implementation of learning-systems approach in an established college is a difficult process and many problems surface which need immediate attention. In order to assist other colleges to answer problems of implementation we video-taped a series of discussions among administrators, instructors and para-professionals on problem solving at various levels in individualized program implementation. (The video-tapes were made during our five-day seminar on learning systems.)

A New Journal "Learner At the Centre"

To further disseminate information about innovative educational methods, the Continuing Education Division is publishing a journal entitled "Learner at the Centre". This journal will provide a fresh approach to learning systems and concentrate on the implementation of innovative educational methods for Ontario.

Response to Needs in Other Colleges

We have participated in a variety of training seminars for faculty at other colleges. This has been beneficial for our faculty as well in that it has led to a continued sharing of ideas long after the seminars were completed.

Need for a Data Bank and Classification System for Objectives

There is a pressing need on the provincial level for a data bank and a classification system to gather, classify, store, and disseminate objectives and resources. The New York State Education Department has a sophisticated system consisting of an advanced data bank with local banks. Their classification system is well developed and accepts only items not already on record. Again to avoid "reinventing the wheel", we should investigate the strengths in the New York State system and take immediate steps to establish a data bank in Ontario. The establishment of such a bank would solve many problems in the search for materials and avoid the costly process of any one program or college trying to locate all the resources it could be using.

11. Planning For The Future

The Role of College Advisory Committees in the Development of Systems-Based Curricula

College advisory committees can play a role in curriculum development in a systems-based program. But in order to maximize their contribution, the college must assist them to realize the potential of systems-oriented curricula.

Industry employs the graduates from our individualized programs and student profiles given to employers reflect what each student can do. It is imperative that industry be made aware of what these new profiles mean if we want them to hire our people.

Institutional Research in Ontario Colleges

Surely, at this stage, it has become imperative that we do more institutional research in the community college. We often say that the cornerstone of the community college is its "excellence in teach-

ing". This statement must be supported with institutional research showing concrete evidence of learning. We need to foster institutional research in teaching, administrative and counselling styles so we can accurately say our work in these areas is innovative and effective.

One of our colleges in Ontario should have an Institute of Educational Sciences to operate as a demonstration model and training centre for the implementation of innovative methods for teachers and administrators at other colleges. We need an operating model since it is easier and better to train faculty in innovative methods if we are actually using some of these in an existing program.

We found that when other colleges first looked to us for help in implementing a systems orientation, our operating program became a demonstration model for implementation.

Survey By BTSD ***Steering Committee***

Recently, the BTSD Provincial Steering Committee completed a survey of implementation of learning systems in retraining programs in all colleges. Data from this survey can provide implementors with a wealth of information, especially on validation and materials. (See Appendix G for a copy of the questionnaire.)

Our Philosophy Is Our Program Of Action

We have made the commitment to put the individual student at the centre of all our attempts. Our goal is the creation of a learning environment that will utilize to the maximum all human and physical resources.

We view our operation in simple terms: Where are we now? Where are we going? What do we need to get us there? The answers take the form of innovative action. To remain complacent and uncritical of our own answers is inconsistent with our use of systems-based instruction.

Our perspective will remain that of assisting the individual learner achieve his goals. It is only in this way that we can effectively and humanly succeed with the number of adults in need of basic education.

We succeed with Individuals.[9]

NOTES

1. Mager, R.G. ***Preparing Instructional Objectives***, Belmont, California: Fearon Publishers Inc., 1962.

2. Silvern, L.C. ***Systems Engineering of Education*** *I: The Evolution of Systems* ***Thinking in Education***, Los Angeles: Education and Training Consultants Co., 1965 (b).

3. Silvern, L.C. (Ed.). "Systems Approach - What Is It?". *Educational Technology*, August 30, 1968.

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4. The Appendices referred to in the body of this paper are available from the Dean of Continuing Education Division, Canadore College, P.O. Box 5001, North Bay, Ontario.

5. Gorth, G.P. "Introduction to CAM", paper submitted by New York State Education Department, Albany, New York.

6. Brown, G.I. *Human Teaching for Human Learning: An Introduction to Confluent Education*, New York: Viking Press, 1971, p. 3.

7. Popham, W.J. (Ed.). *Criterion Referenced Measurement: An Introduction*, Englewood Cliffs, N.J.: Educational Technology Publications, 1971.

8. A series of 12 filmstrip-tape programs by W.J. Popham and Eva Baker and published by Vimcet Associates, Inc., P.O. Box 24714, Los Angeles, California.

9. The innovations described above have continued to develop since the writing of this article. For further information contact the author.

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